

Seizures and Epilepsy - Pediatrics

Introduction

During a seizure, a child has movements or feelings that he or she cannot control. The child may cry, fall unconscious, twitch involuntarily, make chewing motions with their mouth or stare into space. A diagnosis of epilepsy may be made when a person has a seizure more than once because of a brain disorder or injury.

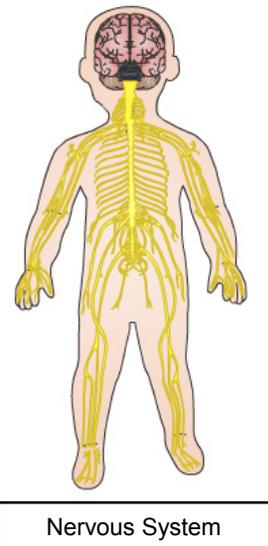
This reference summary explains the symptoms, causes, and treatment options for epilepsy. It also covers what to do when a seizure occurs, how to live with seizures, and how seizures may be prevented.



What Is a Seizure?

The brain is the control center of the body. The right side of the brain controls the left side of the body and the left side of the brain controls the right side of the body. The brain sends orders about how to move and function to the muscles and other body parts through the nerves.

Certain areas of the brain control different areas of the body, such as vision, memory, movement and sensation. Nerves are made of small cells called neurons. In order for the brain to feel, think, and give orders to muscles, the neurons send electrical and chemical signals to each other. Seizures happen because of abnormal electrical activity in the brain.



A person having a seizure will have different symptoms depending on the area of the brain affected. For instance, if an area that controls a muscle is affected, the muscle may become still or jerk uncontrollably.

Causes

There are many causes of seizures. Sometimes there is no known cause and sometimes seizures are caused by a disease or injury of the brain.

During development and the first few years of childhood, the brain undergoes a lot of growth. During this growth period, infections, poor nutrition and poor supply of oxygen may cause epilepsy.

A fever, too much water, or high or low blood sugar could cause a seizure. After a head injury due to an accident or a stroke, the brain repairs itself by making new wiring. If the new wiring is abnormal, it could cause seizures.



Diseases of the brain, such as hydrocephalus and meningitis, could cause epilepsy. Lead and carbon monoxide poisoning could lead to seizures. Some drugs or medications could also lead to seizures. Brain tumors, strokes, infections and bleeding could lead to seizures. Some types of epilepsy tend to run in families, which means they may have hereditary causes.

Types of Seizures

Due to the complexity of the brain and its functions, there are many types of seizures. There are many different words used to describe different types of seizures:

- Convulsions.
- Epileptic fits.
- Tonic-clonic seizures.

Most seizures last from a few seconds to a few minutes and most stop on their own.

Seizures that affect only one part of the brain are called partial seizures. In partial seizures, the child may experience sudden feelings of joy or sadness or sudden sensations of smell, hearing or vision. Another kind of partial seizure is called a complex partial seizure. During this kind of seizure, the child may have abnormal repetitive behaviors, such as blinking, moving in a circle, striking out or moving an arm or leg without being able to control the movement.

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Seizures that spread to the rest of the brain are called generalized seizures. These seizures may cause the person to:

- Become unconscious.
- Fall.
- Have muscle spasms.
- Have jerking muscles all over the body.
- Stare into space, for a few seconds.



Not all children who have a seizure have epilepsy. Some children have just one seizure at some point in their life and never have another one. Sometimes a child may have a seizure during an illness with a high fever. Most of the time, these seizures do not happen again unless there has been damage to the brain.

When a person has a seizure, the brain shows abnormal electrical activity that can be recorded by doctors on a special machine called an EEG. Some children have seizure-like behavior without any abnormal electrical activity. These are called non-epileptic seizures or pseudo-seizures. They may be due to stress or emotional trauma. Some children can tell when they are about to have a seizure because they have a specific feeling before the seizure starts. This is called an “aura”.

Diagnosis

Health care providers take a medical history, do blood tests and use many other medical tests to tell whether a person has epilepsy.

A test commonly used to diagnose epilepsy is called an electroencephalogram, or EEG. This test records brain waves. In most cases of epilepsy a health care provider can determine if the brain has abnormal electrical activity due to a seizure by reading the EEG. During an EEG, electrodes are placed on the scalp and brain waves are measured. The health care provider may also want to do an EEG while the patient is sleeping.



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A health care provider may use a magneto-encephalogram, or MEG. The purpose of this test is similar to an EEG, except that it measures magnetic signals in the brain instead of electrical signals. Because of this difference, it does not need electrodes and can discover signals from deeper areas of the brain than the EEG can.

The health care provider may also request a brain scan in order to see structures inside the brain. Examples of brain scans are MRI, CT, and PET scans. These allow the doctor to see structures, such as tumors or cysts, which could be causing the seizures.

Treatment Options

Most children with epilepsy can control their seizures with medication. The medication used depends on the type of seizures, the patient's age and medical condition.

The health care provider usually orders a medication and changes the dose depending on whether the person still has seizures. Usually, the health care provider starts at a low dosage and increases it if needed, after each blood test. Sometimes the health care provider will tell the person they can stop using the medication. This depends on EEG tests, and how long the person has been free of seizures.



If a medication is stopped suddenly, the child may have more seizures that are harder to treat.

The side effects of anti-seizure drugs may include:

- Low energy.
- Tiredness.
- Weight gain.
- Dizziness.
- Depression.



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If your health care provider orders an anti-seizure drug, he or she will discuss the benefits and risks of it. Some children may be allergic to certain medications. Contact the health care provider immediately if your child develops any kind of rash. In some cases of childhood seizures, a special diet that is rich in fat and low in sugar can help to lessen how often seizures happen. This kind of treatment should be done under the supervision of a health care provider to make sure the child gets proper nutrition.

When medical treatment fails to control the seizures, brain surgery may be considered. Brain surgery for seizures tries to remove the part of the brain that is responsible for the abnormal electrical signals and the cause of the seizures. But these operations are rare.

Another operation, called a vagal nerve stimulator, may be suggested. During this operation the surgeon inserts an electronic device under the skin in the upper left chest. The electronic device stimulates a big nerve in the neck known as the vagus nerve. The stimulation helps some patients to have seizures less often. Your health care provider will tell you if this operation is right for your child.



Living with Epilepsy

When seizures are controlled, most people with epilepsy can have a normal life. But people with seizures that are not well controlled need to take precautions that may affect their daily living.

Teenagers with uncontrolled seizures may not be able to drive, or operate dangerous machinery. Most states will not give a driver's license to someone with epilepsy unless the person can prove that he or she has been seizure-free for a certain period of time. The length of this period varies from state to state. School activities and hobbies that could cause injury may have to be limited in case your child loses consciousness or attention for a few moments.



Some activities and sports may be possible with supervision. Speak with your child's health care provider if you have questions about what activities your child can participate in. A lot of activities and sports are safe for a person with epilepsy, like jogging and volleyball. Contact sports should be avoided, since even minor trauma

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could set off a seizure. Therefore, a person with epilepsy may not be able to play football or hockey.

Since some anti-seizure medications interfere with memory and concentration, children with epilepsy may need extra time to learn and complete their homework. Teenagers with epilepsy should not drink alcoholic beverages or do drugs. Doing so increases the chances of seizures.

Dealing with a Seizure

Seizures can last from just a few seconds up to a few minutes. Most seizures stop on their own. But in rare cases seizures can last hours, requiring urgent medical attention. This is called status epilepticus. If you notice a child having a seizure, protect the person from harm until he or she wakes up. Some people may sleep for awhile after a seizure. This is called the post-ictal period.

The following are some tips that can lessen the chances of injury during a seizure.

- Lay the person on the floor or a flat surface.
- Put something soft under his or her head.
- Turn the head gently to one side to prevent any vomit from being sucked into the lungs as the person breathes.

If the child is confused during a seizure and is moving around, remove anything from the area that may cause injury.

During your child's seizure:

- Do not force anything into his or her mouth.
- Do not give him or her water or medicine until the seizure is over.
- Do not try to stop the jerking movement.

People with epilepsy can lead full, active lives and usually return to normal activity after a seizure. If the seizure lasts more than 5 minutes, your child does not wake up between seizures or if he or she stops breathing, call 911.



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Summary

Epilepsy is a disorder of the brain. Seizures are signs of epilepsy but not all seizure-like symptoms are due to epilepsy. There are many types and causes of seizures. It is important to see a health care provider for the diagnosis and appropriate treatment.

Most cases of epilepsy can be controlled with medications, allowing the child to live a normal and productive life.



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